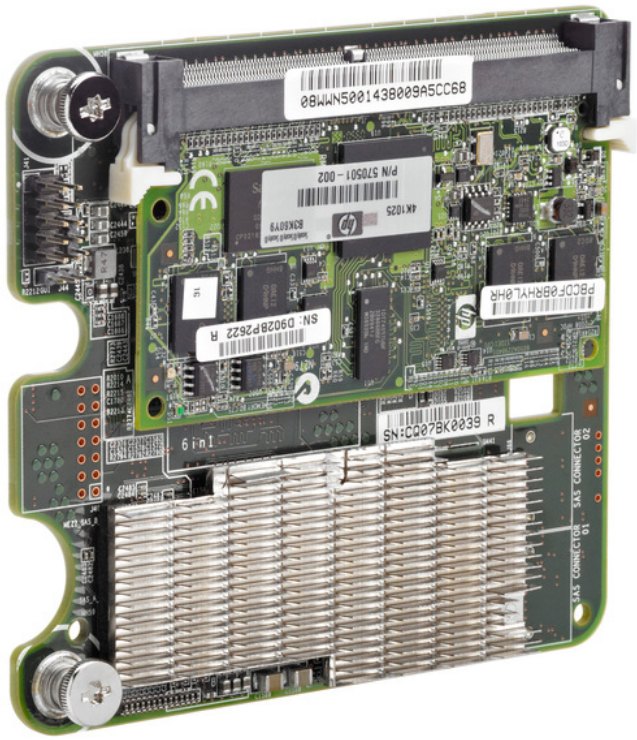
Overview

HPE Smart Array P711m Controller

The HPE Smart Array P711m is a PCI-Express (PCIE) mezzanine card supporting shared and direct attached SAS Storage. It is one of the highest performing controllers in the HPE 6Gb/s SAS portfolio and provides new levels of reliability, connectivity, and storage performance for HPE Blade servers through its support of the latest SCSI technology and advanced RAID capabilities. Supports up to 108 zoned direct attached SAS or SATA hard drives per HPE Smart Array P711m Controller.



HPE Smart Array P711m Controller

What's New

- Support for HPE MSA 2040 Storage

Models

HPE Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21

NOTE: For MDS600 host connectivity, P711m firmware 5.32 or higher, 6Gb BL SAS switch firmware 2.0.1.0 or higher and MDS600 firmware 3.44 are required.
NOTE: For D2600/D2700 support in Blade configuration, P711m firmware 5.32 or higher, 6Gb BL SAS switch firmware 2.0.1.0or higher and D2600/D2700 firmware 1.34 or higher are required.

Standard Features

The Smart Array Advantage

- **The innovative design** of Hewlett Packard Enterprise and integration work within the Smart Array family of products creates customer value that is unmatched in the industry. Use of Smart Array products across multiple applications results in a much lower Total Cost of Ownership (TCO) than any other server storage RAID product. The HPE Smart Array family brings an unparalleled return on investment.
- **Data Compatibility Data Compatibility** with all Serial Smart Array controllers allows simple and easy upgrades any time needs for higher performance, capacity, and availability increase.
- **Consistent Configuration and Management Tools.** All Smart Array products utilize a standard set of management and utility software. These tools minimize Total Cost of Ownership (TCO) by reducing training requirements and technical expertise necessary to install and maintain HPE server storage.
- **Pre-Failure Warranty** Pre-Failure Warranty means Systems Insight Manager not only reports when a drive is going to fail but allows replacement of failing drives prior to actual failure. For complete details, consult the HPE Support Center or refer to your HPE Server documentation

Key Features

- Smart Array PCIe mezzanine card that connects to a HPE 6Gb/s SAS BL Switch through the c-Class enclosure high-speed mid-plane supporting shared SAS storage.
- Eight (8) 6Gb/s SAS physical links distributed across 4 external 2x ports to supports up to 4 6Gb/s SAS Switches
- Storage interface (SAS/SATA)
  - 6Gb/s SAS technology delivers up to 600 MB/s per physical link.
  - 3Gb/s SATA technology delivers up to 300 MB/s for directly attached SATA drives.
  - Mix-and-match SAS and SATA drives. Deploy drive technology as needed to fit the computing environment.
  - Support for SAS tape drives, SAS tape autoloaders and SAS tape libraries.
- RAID controller features
  - 1 GB flash-backed write cache (not all of which is available for user data)
  - RAID 0, 1, , 5, 6, 50, 60
  - RAID configuration for shared storage is controlled by the Array Controller of enclosure the array
    - RAID 0.1.3, 5.6.10.50
- License key for Smart Array Advanced Pack (SAAP) included
- Software consistency among all Smart Array family products: Array Configuration Utility, Systems Insight Manager, Array Diagnostic Utility (ADU) and SmartStart
- 1G Flash Backed Write Cache (FBWC) provides indefinite write cache data retention in the case of unexpected power outage.
- Multi-path support available in Smart Array firmware when using zoned direct attached storage. Both direct attached storage paths are load balanced for improved performance when using the enclosure in dual domain mode using SAS HDDs.

Online Management Features

- Online Array Expansion
- Online RAID Level Migration Online Stripe Size Migration Online Spares (Global)
- User Selectable Expand and Rebuild Priority
- Online Logical Drive Extension Availability

Performance

- Eight (8) 6Gb/s SAS physical links distributed across 4 external 2x ports which supports up to 4 6Gb/s SAS Switches
- 6Gb/s SAS (600MB/s bandwidth per physical link)
- The P711m supports higher performance between the 6G SAS Switch and MDS600 by attaching 2 SAS cables from any quad of 6G SAS Switch ports to the 2 ports on the MDS600

Standard Features

IO module to create an 8x wide SAS port
- 1G Flash Backed Write Cache

Capacity

Dependent upon attached enclosures and arrays.
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04123144
(HPE MSA 2040 Storage)
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04140213
(HPE 600 Modular Disk System)
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04168365
(HPE P2000 G3 Modular Smart Array Systems)

Availability

Provides increased server uptime by providing advanced storage functionality:

- Online RAID Level Migration (between any RAID level)
- Online Capacity Expansion
- Logical Drive Capacity Extension
- Global Online Spare
- Pre-Failure Warranty

Fault Tolerance RAID Descriptions

Keeps data available and server running while a failed drive is being replaced; several fault tolerance configurations are supported including:

- **RAID 6** (Advanced Data Guarding): Supported with a minimum of 4 drives. This allocates two sets of parity data across drives. This level of fault tolerance can withstand a double drive failure without downtime or data loss.
- **RAID 60:** Supported with a minimum of 8 drives. This volume is composed of two or more RAID 6 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 6 parity group can sustain up to two drive failures without incurring data loss.
- **RAID 5** (Distributed Data Guarding): Supported with a minimum of 3 drives. This allocates one set of parity data across drives. This level of fault tolerance can withstand a single drive failure without downtime or data loss.
- **RAID 50:** Supported with a minimum of 6 drives. This volume is composed of two or more RAID 5 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 5 parity group can sustain a single drive failure without incurring data loss.
- **RAID 1 & 10** (Drive Mirroring): Supported with a minimum of 2 drives. This allocates half of the drive array to the data and the other half to the mirrored data, providing two copies of the data.
- **RAID 1 ADM & 10 ADM** (Advanced Data Mirroring): Supported with a minimum of 3 drives. RAID 1 ADM creates redundant copies of the data using 3 drives. RAID 10 ADM stripes data across two or more sets of RAID 1 ADM volumes. This level of fault tolerance can withstand a double drive failure within a RAID 1 ADM volume without downtime or data loss.

NOTE: When the P711m is connected to the MDS600 configured with the HPE MDS600 Dual I/O Module Option Kit or to D2600/D2700 with dual domain SAS HDDs, there are multiple physical paths to each HDD, enabling the server to endure P711m port failures, switch failures, cable pulls, cable failures, and MDS600 IO module failures without interruption of normal storage I/O.
NOTE: See Enclosure QuickSpecs for descriptions of RAID levels specific to the HPE P2000 G3 Arrays at: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04168365**

Standard Features

Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure

- **Recovery ROM:** This feature provides unique redundancy that protects from a ROM image corruption. A new version of firmware can be flashed to the ROM while the controller maintains the last known working version of firmware. If the firmware becomes corrupt, the controller will revert back to the previous version of firmware and continue operating. This reduces the risk of flashing firmware to the controller.
- **On-Line Spares:** There is no limit to the number of spare drives that can be installed prior to drive failure. If a failure occurs, recovery begins with an On-Line Spare and data is reconstructed automatically.

Ease of Use

Consistency and Upgradeability make the Smart Array family unique in the industry:

- GUI based configuration, management and diagnostic software tools
- Common data format between generations of products

Compatibility

Supported Servers

HPE ProLiant Server Blades

HPE ProLiant BL280c G6
HPE ProLiant BL460c G6 & G7
HPE ProLiant BL465c G6 & G7
HPE ProLiant BL490c G6 & G7
HPE ProLiant BL620c G7
HPE ProLiant BL680c G5 & G7
HPE ProLiant BL685c G6 & G7

HPE Integrity Server Blades

HPE Integrity BL860c i2
HPE Integrity BL870c i2
HPE Integrity BL870c i4
HPE Integrity BL890c i2
HPE Integrity BL890c i4

NOTE: Some servers listed above may be discontinued.

NOTE: For more information on supported server options, please refer to appropriate server QuickSpecs.

Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows 2003
Microsoft Windows 2008 R2
SLES 10
SLES 11
Red Hat Enterprise Linux 5
Red Hat Enterprise Linux 6
VMware ESX 4.0
VMware ESX 4.1
VMware ESXi 5.0
HP-UX 11iv3

NOTE: For more information on Hewlett Packard Enterprise Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at:
http://www8.hp.com/us/en/products/servers/management/operating-environments/os-support-matrix.html.

Software Suite

All Smart Array products share a common set of configuration, management and diagnostic tools, including Array Configuration Utility, Array Diagnostic Utility (ADU), and Systems Insight Manager. This software consistency of tools reduces the cost of training for each successive generation of product and takes much of the guesswork out of troubleshooting field problems. These tools lower the total cost of ownership by reducing training and technical expertise necessary to install and maintain HPE server storage.

Systems Insight Manager

- Powerful server and server options/storage manager tool
- Monitors over 1200 system wide parameters
- Configuration/Diagnostic Utilities

HPE Array Configuration Utility (ACU)

- Powerful Web based configuration utility for all Smart Array controllers
- Provides a graphical view of HPE server drive array configurations
- Allows for management of multiple arrays over a secure internet connection from anywhere in the world

Compatibility

	• Easy to use Wizards for configuration • Runs offline (via Smart Start) and online on Windows
HPE Option ROM Configuration for Arrays (ORCA)	• An alternative method for easily viewing, creating, and deleting multiple arrays and logical volumes during system power up. • For advanced array configurations use ACU
HPE Storage Management Utility	• Initial System Configuration Wizard is the easiest and simplest method for configuring the storage system initially. • Command Line Interface (CLI) for command level method of configuring and managing the storage • Main User Interface for multi-server environments that need customization for creation of storage Luns and targets. • P2000 G3 Arrays can be configured using Storage Management Utility (SMU) or Command Line Interface (CLI) both of which are embedded in the P2000 G3 Array controller firmware.
HPE Array Diagnostic Utility (ADU)	• In depth diagnostic and reporting utility for all Smart Array controllers

Service and Support

Warranty	The warranty for this device is 3 years parts only. **Pre-Failure Warranty**: Drives attached to the Smart Array Controller and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty. For complete details, consult the HPE Support Center or refer to your HPE Server Documentation.
Software Product Services	Standalone telephone support Rights to new license version Media and documentation updates
Hardware Product Services	Installation services On-site maintenance (includes warranty support) Response time upgrades during the warranty period Post-warranty coverage RAID setup and performance consulting via statement of work
Warranty Upgrade Options	**Response** - Upgrade on-site response from next business day to same day 4 hours **Coverage** - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days **Duration** - Select duration of coverage for a period of 1, 3, or 5 years Warranty upgrade options can come in the form of Care Packs, which are sold at the HPE System level this product attaches too.
HPE Care Pack Information	HPE Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage. Care Packs for this option is sold at the system level this option attaches too. HPE Care Pack is not available for less than the product's warranty duration. HPE Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required. HPE Pointnext operational services are prepaid. **NOTE:** For additional HPE Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL: **http://www.hp.com/hps/carepack/**

Related Options

HPE Disk Storage Systems	**Disk Enclosures and Storage Array**	
	HPE D2000 Disk Enclosures	
	HP D2600 Disk Enclosure	AJ940A
	NOTE: Supports 12 LFF drives, and SAS 6Gb/s and SATA 3Gb/s.	
	HPE D2700 Disk Enclosure	AJ941A
	NOTE: Supports 25 SFF drives, and SAS 6Gb/s and SATA 3Gb/s.	
	NOTE: Please see the supported Disk Enclosure QuickSpecs for a list of compatible hard drives: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04111697**	
	HP MDS600 with Dual I/O Modules Disk System	AJ866A
	HP MDS600 Dual I/O Module Option Kit	AP763A
	NOTE: Includes all MDS600 supported bundles.	
	NOTE: Please see the supported Disk Enclosure QuickSpecs for a list of compatible hard drives: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04140213**	
	HPE MSA 2040 Storage	
	HP MSA 2040 SAS Dual Controller LFF Storage	C8S54A
	HP MSA 2040 SAS Dual Controller SFF Storage	C8S55A
	NOTE: Please see the supported MSA QuickSpecs for a list of compatible hard drives: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04123144**	
Mini SAS to Mini SAS Cables	HPE External Mini SAS 2m Cable	407339-B21
HPE SAS Switches	HPE 6Gb SAS Switch Single Pack for HPE BladeSystem c-Class	BK763A
	HPE 6Gb SAS Switch Dual Pack for HPE BladeSystem c-Class	BK764A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information at: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04123176**	
HPE c Class Blade Enclosures	HP BLc7000 Configure-to-order 3 In LCD ROHS Enclosure	507019-B21
	HP BLc7000 Enclosure with 1 Phase 2 Power Supply 4 Fan ROHS ICE License	507014-B21
	HP BLc7000 Enclosure with 1 Phase 6 Power Supply 10 Fan FI ROHS ICE License	507015-B21
	HP BLc7000 Enclosure with 3 Phase 6 Power Supply 10 Fan INTL ROHS ICE License	507016-B21
	HP BLc7000 Enclosure with 3 Phase 6 Power Supply 10 Fan ENG ROHS ICE License	507017-B21
HPE P2000 G3 Modular Smart Array Systems	**P2000 G3 SAS Controller**	
	HP P2000 G3 SAS MSA Array System Controller	AW592A
	NOTE: Four 6Gb SAS ports per controller.	
	P2000 Chassis	
	P2000 Controller-less Chassis (AC-powered)	
	HP P2000 LFF Modular Smart Array Chassis	AP838A
	NOTE: Will accept one or two controllers or Disk Enclosure I/O modules.	
	HP P2000 SFF Modular Smart Array Chassis	AP839A
	NOTE: Will accept one or two controllers, not I/O modules.	
	Configured Units, 6 Gb SAS Systems	
	HP P2000 G3 SAS MSA Dual Controller LFF Array System	AW593A
	HP P2000 G3 SAS MSA Dual Controller SFF Array System	AW594A
	Disk Enclosures	
	HP P2000 Dual I/O LFF Drive Enclosure	AP843A

Related Options

	NOTE: Twelve 3.5" drive bays w/ two .5m mini-SAS to mini-SAS cables. Used with single or dual controller LFF or SFF array head.	
	HPE P2000 LFF Drive Enclosure I/O Module	AJ844A
	NOTE: Cable not included. Designed exclusively for use with the LFF chassis PN AP838A to create a single I/O JBOD.	
HPE Tape Backup	**Tape Autoloaders**	
	HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A
	HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP 1/8 G2 Ultrium 920 SAS Autoloader	AH558A
	Tape Libraries	
	HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library	AK378A
	HP MSL2024 Ultrium 920 SAS Tape Library	AH559A
	HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
	HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library	AK380A
	HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A
	HP MSL8096 2 LTO-4 Ultrium 1760 SAS Tape Library	AK382A
	HP MSL8096 2 LTO-5 Ultrium 3000 SAS Tape Library	BL539A
	NOTE: Hewlett Packard Enterprise recommends a maximum of 2 tape drives per 6Gb/s SAS BL Switch and 64K transfer sizes. Attaching a library with 4 tape drives requires purchasing a second tape library SAS cable (AN975A or AN976A) and attaching 2 drives to the redundant 6Gb/s SAS BL Switch. Attaching more than 2 tape drives per switch and transfer sizes greater than 64K could result in a failed backup or restore. A future release of firmware on the tape library drives will allow more than 2 tape drives to be attached to a switch.	

Technical Specifications

Dimensions	4 in x 4.5 in x 0.8 in (10.1 cm x 11.4 cm x 2 cm)
Disk Drive and Enclosure Protocol Support	SAS protocol: 6Gb/s, 3Gb/s, or 1.5Gb/s SATA protocol: 3Gb/s or 1.5Gb/s
SAS Connectors	Four (4) 2x connectors external
Memory Bus Speed	DDR2-800 (6.4 GiB/s maximum bandwidth)
SAS Port Link Rate	6Gb/s per physical link
Software Upgradeable Firmware	Yes
Cache Memory	1 GB capacity (not all of which is available for user data) 64-bit data width with 8-bit error correcting code (ECC) Flash-backed on power loss Tether to capacitor pack Removable
Logical Drives Supported	512 logical drives external for shared storage 64 logical drives for direct attached storage
Maximum Capacity	Variable depending on attached enclosure
Memory Addressing	64-bit, supporting servers memory space greater than 4 GB
RAID Support	RAID 0, 1, 3, 5, 6, 10, 50 on P2000 SA G3
Maximum Number of Physical Drives	108 for direct attach storage 149 small form factor drives or 96 large form factor for shared storage
Upgradeable Firmware	Flashable ROM with redundant firmware images

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett Packard Enterprise offers end-of-life product return, trade-in, and recycling programs, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner. **http://www8.hp.com/us/en/hpe/hp-information/livingprogress/environmentalprogress/product-recycling.html#.V-lPA_krKiM** The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site. These instructions may be used by recyclers and other WEEE treatment facilities as well as HPE OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment. **http://www8.hp.com/us/en/hpe/hp-information/livingprogress/environmentalprogress/product-recycling.html#.V-lPA_krKiM**

Summary of Changes

Date	Version History	Action	Description of Change
23-Oct-2017	Version 14	Added	Care Pack naming and Service and Support- Parts and Materials updated.
07-Oct-2016	From Version 12 to 13	Changed	QuickSpecs was rebranded.
08-Nov-2013	From Version 11 to 12	Added	Added Support for HPE MSA 2040 Storage.
10-Sep-2013	From Version 10 to 11	Changed	Related Options was revised.
12-Dec-2012	From Version 9 to 10	Changed	Change made in Compatibility section to Supported Servers, servers added.
03-Ago-2012	From Version 8 to 9	Changed	Changes made in the Related Options and Compatibility sections.
06-Mar-2012	From Version 7 to 8	Changed	A link change was made in the Hard Drives section.
18-Nov-2011	From Version 6 to 7	Changed	Server Support and Operating Systems and Virtualization Software Support for ProLiant Servers were revised.
14-Nov-2011	From Version 5 to 6	Changed	Models, Operating Systems and Virtualization Software Support for ProLiant Servers and Hard Drives were revised.
24-Oct-2011	From Version 4 to 5	Changed	Changes were made to the Notes in the Models section.
30-Sep-2011	From Version 3 to 4	Changed	Changes were made throughout the QuickSpecs.
01-Jul-2011	From Version 2 to 3	Changed	Changes were made throughout the QuickSpecs to include the removal of "StorageWorks".
29-Apr-2011	From Version 1 to 2	Changed	Changes were made throughout the QuickSpecs.

c04111558 - 14035 - Worldwide - V14 - 23-October-2017